

ABSTRACT OF THE DISCLOSURE

A magnetic field sensor device (2) is described that comprises an oscillatory member (8) and current control means (6). The current control means (6) is arranged to pass an alternating current (AC) along at least first (10) and second (12) current paths provided through the oscillatory member (8) and is arranged to provide magnetic gradiometer mode operation (i.e. to measure magnetic field gradient) in which current flow through the first current path (10) is in substantially the opposite direction to current flow through the second current path (12). The current control means (6) can also prove magnetometer mode operation (i.e. to measure magnetic field strength). The magnetic field sensor (2) may be used in a compass.